

YARD WASTE HANDLING APPARATUS

CROSS-REFERENCE TO RELATED
APPLICATION

This is a continuation-in-part application of application Ser. No. 08/753,098 filed Nov. 20, 1996, entitled YARD WASTE HANDLING APPARATUS, now U.S. Pat. No. 6,019,431.

TECHNICAL FIELD

The present invention relates generally to containers for yard waste, and more particularly to an improved yard waste handling apparatus for the efficient storage and transport of grass clippings and other debris, in addition to the transport of associated lawn equipment.

BACKGROUND OF THE INVENTION

Commercial lawn mowing businesses typically utilize a trailer to transport the lawn equipment associated with the business and then have a separate truck or trailer for hauling grass clippings, limbs and other debris associated with the business. One of the main problems suffered by conventional commercial lawn businesses is the time required to load grass clippings in bags or onto the back of trucks. In addition, it is an arduous task to unload the yard waste at the landfill or other designated site.

A further problem associated with the majority of commercial lawn businesses is the loading and unloading of equipment from trailers. Typically, ramps must be lifted and installed in position to roll the equipment onto and off of the trailer.

SUMMARY OF THE INVENTION

It is therefore a general object of the present invention to provide an improved yard waste handling apparatus.

A further object is to provide a yard waste handling apparatus which provides a large container for storing yard waste and an automated dump box for loading the container.

Yet another object of the present invention is to provide a trailer or truck with a dump box and space for hauling associated lawn equipment.

Yet a further object is to provide a yard waste handling apparatus with powered ramps for the easy loading and unloading of equipment from the trailer or truck.

Still another object of the present invention is to provide a yard waste handling apparatus which is simple to use and efficient in operation.

These and other objects of the present invention will be apparent to those skilled in the art.

The yard waste handling apparatus of the present invention includes a trailer or truck with a dump box operably mounted on the forward end and a tailgate pivotally mounted on the rearward end. The tailgate may be pivoted from a vertical position to a loading position sloped downwardly to the ground. The dump box has an operable front wall which may be pivoted to an open position to permit dumping of the contents from the dump box. A hydraulic scissors hoist under the dump box and connected to the trailer or truck frame is operable to pivot the dump box about the forward edge of the bottom of the dump box to thereby dump the contents of the dump box to one side of the trailer or truck. A hopper is mounted on a lift arm which is operably mounted to the dump box, the lift arm raising the hopper from a loading position on the ground to a raised position

adjacent the open upper end of the dump box. A hydraulic cylinder connected between the hopper and the lift arm is operable to pivot the hopper to a dumping position over the open upper end of the dump box.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the invention;

FIG. 2 is a side elevational view of the invention;

FIG. 3 is a rearward end elevational view of the invention;

FIG. 4 is a view similar to FIG. 3, with the dump box operated to a dumping position;

FIG. 5 is an enlarged rearward end elevational view of a portion of the dump box, with an associated loading hopper moved to an upper position;

FIG. 6 is a view similar to FIG. 5, but with the loading hopper moved to a dumping position; and

FIG. 7 is a schematic view of the hydraulics for operating the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, in which similar or corresponding parts are identified with the same reference numeral, and more particularly to FIG. 1, the yard waste handling apparatus of the present invention is designated generally at 10 and includes a trailer 12 with a flat bed 14 supported on a wheel set 16, with an operable tailgate pivotally connected to a rearward end thereof, and a goose-neck type hitch 20 mounted on a forward end thereof. Although a trailer is illustrated in the drawings, the apparatus of this invention may be mounted on a truck frame as well.

Trailer 12 includes a generally rectangular frame 22 having opposing side members 24 and 26, a rearward cross-member 28, and a forward bulkhead 30. A 400 bushel dump box 32 is connected to the frame 22 at the forward end thereof adjacent bulkhead 30. Bed 14 extends rearwardly from dump box 32 to the rearward cross-member 28 for supporting various lawn equipment on trailer 12.

Tailgate 18 includes a generally rectangular frame 34 with auxiliary support bars 36 mounted between the sides of the frame for additional strength. An expanded metal sheet 38 is mounted to one side of the frame and extends completely thereacross to form an upper surface upon which lawn equipment may be supported while loading and unloading trailer 12.

A crossbar 40 extends across and is mounted to a plurality of the auxiliary support bars 36 and is generally centered on the bottom of frame 34. The extensible rod 42 of a double acting cylinder 44 is pivotally connected to crossbar 40, and a lower end 44a of cylinder 44 is pivotally connected to the rearward cross-member 28. In this way, tailgate 18 may be mechanically lowered by retracting rod 42 within cylinder 44, as shown by arrow 46 in FIG. 2. Tailgate 18 is raised to a vertical position by reversing the process and extending rod 42. A retractable pin 48 is operably mounted to the upper end of a stanchion 50 and is operable between a locked position engaging the tailgate frame 34 and an unlocked position permitting pivotal movement of tailgate 18. Stanchion 50 is mounted in an upright position at the rearward end of side member 26, to maintain tailgate 18 in a vertical position when pin 48 is moved to the locked position. A similar pin 48' and stanchion 50' are located on the opposite side of tailgate 18 at the rearward end of side member 24, as shown in FIG. 1, to selectively lock the other side of tailgate 18 in the vertical position.

Referring now to FIGS. 1-4, dump box 32 includes forward and rearward walls 52 and 54, a back wall 56, an operable front wall 58, and a bottom 60. Dump box 32 is pivotally connected along the front edge of bottom 60 by a hinge 62, with the back edge of bottom 60 resting on frame side member 26. As shown in FIG. 4, a scissors hoist 64 has a lower end connected to the trailer frame 22 and the upper end connected to the dump box bottom 60 adjacent the back edge thereof. Hydraulic cylinder 66 pivots upper and lower legs 64a and 64b of scissors hoist 64 about a pivot pin 68 to expand hoist 64 from a folded retracted position (shown in FIGS. 2 and 3) to an extended dump position (shown in FIG. 4), to selectively pivot dump box 32 on hinge 62.

Front wall 58 is pivotally connected along its upper edge to a support beam 70 extending between the upper front corners of forward and rearward walls 52 and 54 at a hinge 72. An arm 74 is cantilevered outwardly from the center of support beam 70 and has one end of a cylinder 76 pivotally connected thereto. Rod 78 of cylinder 76 is pivotally connected to front wall 58 near the center thereof and is retractable to pivot front wall 58 about hinge 72, as shown in FIGS. 3 and 4, to thereby permit the dumping of the contents of dump box 32.

A column 80 is mounted on the outward face of rearward wall 54 for movement with dump box 32. A similar column 82 is mounted on the outer surface of forward wall 52 diametric to column 80. A generally U-shaped lift arm 84 has one leg 84a pivotally connected to column 80, the opposite leg 84b pivotally connected to column 82, and a base leg 84c connecting the opposite ends of legs 84a and 84b. As shown in FIG. 3, lift arm 84 is pivotable from a lower position shown in broken lines to an upper position shown in solid lines, with base leg 84c moving through an arc outwardly of dump box back wall 56. A cylinder 86 has a lower end pivotally connected at the bottom of column 80 and the extensible rod 88 thereof pivotally connected to lift arm leg 84a. A matching cylinder 86' and associated rod 88' are operably mounted between the lower end of column 82 and lift arm leg 84b. Cylinders 86 and 86' are operable to raise and lower lift arm 84, as shown in FIG. 8.

Lift arm 84 has a fourteen bushel hopper 90 operably connected thereto and serves to raise and lower hopper 90 to dump batches of yard waste from the hopper into dump box 32. As shown in FIGS. 5 and 6, hopper 90 includes a front wall 92, a back wall 94, a bottom 96, and opposing side walls 98 and 100 (side wall 100 being shown in FIG. 3). Hopper 90 is pivotally supported on lift arm 84 by a pair of support brackets 102 attached to the outer surfaces of side walls 98 and 100. A pivot axle 104 pivotally connects brackets 102 to lift arm 84 to pivot hopper 90 about axle 104. A pair of ears 106 are rigidly mounted to legs 84a and 84b and project outwardly from adjacent the base leg 84c thereof. A cylinder 108 is pivotally connected to the distal end of ears 106 with an extensible rod 110 pivotally connected to the back wall 94 of hopper 90. Cylinders 108 are extensible to pivot hopper 90 about axle 104 over the top of dump box 32, to empty the contents of hopper 90 into dump box 32, as shown in FIGS. 5 and 6. Referring once again to FIG. 1, a control panel 112 is mounted on a fender 114 of trailer 12 at a height which permits easy operation by a person either standing by the trailer or sitting atop a riding mower or similar piece of equipment. Control panel 112 includes five actuator levers 116, 118, 120, 122, and 124 operably mounted thereon to control the various cylinders of yard waste handling apparatus 10 as described in more detail hereinbelow. A safety switch 126 is also provided on control panel 112 to selectively engage or disengage an hydraulic pump 128 (shown in FIG. 7).